

June 24, 1993

Martin J. Hamper
Project Manager
Warzyn Inc.
2100 Corporate Drive
Addison, Illinois 60101

COPY

Dear Mr. Hamper:

Enclosed is the final version of the extended bioventing treatability study performed on soils from the American Chemical Services NPL Site, in Griffith, Indiana. The soil sample utilized in the ENVIROGEN treatability study was from the Off-site Containment Area. The majority of compounds originally identified in the off-site containment soil sample have been reduced to less than either the remediation level or the analytical detection limit. The VOCs and SVOCs were removed by a combination of volatilization and bioremediation. The extent of removal attributable to either mechanism is difficult to quantify, but it is important to remember that during the initial six week experimental phase the greatest removals were consistently observed in the nutrient amended soil column. In addition, the lowest vapor phase concentrations were observed in the nutrient amended column.

We believe that application of bioventing techniques at the Griffith site can lead to lower operating costs, due to reductions in air flow rates and less reliance on vapor treatment by either carbon adsorption or thermal oxidation. In addition, further reductions in semi-volatile compounds should occur during extended operation of the bioventing system. If you have any further questions I may be reached at (609)-936-9300.

Sincerely yours,



Gene F. Bowlen, Ph. D.

Manager, Remediation Technologies

**Soil Vapor Extraction Treatability Study
(Eighteen Week Results)**

American Chemical Services NPL Site

Prepared for:

WARZYN, INC.

2100 Corporate Drive

Addison, Illinois 60101

Prepared by:

ENVIROGEN, INC.

Princeton Research Center

4100 Quakerbridge Road

Lawrenceville, NJ 08648

(609) 936-9300

June 15, 1993

Operation of the soil columns from the initial biotreatability study, utilizing soils from American Chemical Services NPL Site, was continued after the original sampling period ended in late February. The initial time frame of six weeks was extended by an additional twelve weeks. At the six week sampling period, each of the soil columns was disassembled, the soil homogenized and soil samples removed. The remaining soil was repacked into each of the columns, the air system connected and air flow at 5 ml/minute was continued. Additional nutrients were added to the nutrient amended column to insure that the column would not be nutrient limited.

After twelve weeks of additional operation, the nutrient amended soil column was disassembled, homogenized and samples submitted to a certified laboratory, National Environmental Testing, Inc. (NET) for VOC and SVOC analysis (EPA methods 8240 and 8270). A copy of the NET analytical results of the VOC and SVOC analysis are included in Appendix A of this report. The remaining soil was analyzed by ENVIROGEN for ammonia, orthophosphate, nitrate, pH and microbial counts. The non-amended and azide-treated control columns were not disturbed.

Results and Discussion

The columns were operated for a total of eighteen weeks during which time approximately fourteen thousand pore volumes of air were passed through the column. After eighteen weeks, the majority of VOC's were removed to less than the analytical detection limit (Table 1). All of the BTEX compounds were below the analytical detection limit which is several orders of magnitude below the various remediation levels. The only target VOC's detected were methylene chloride (0.010 mg/kg) and tetrachloroethene (0.008 mg/kg). Each of the detected compounds is well below the required remediation level concentration. The analytical detection limit of 0.006 mg/kg soil was below the remediation level for each of the target VOCs.

The concentrations of the majority of SVOC's were below the analytical detection limit of 400 µg/kg soil. During the final twelve weeks of operation all the compounds, at detectable levels, except bis (2-ethylhexyl) phthalate, declined to concentrations that were close to, if not below, the remediation levels (Table 2). Naphthalene and di-n-butylphthalate were each below their respective action levels. The isophorone concentration declined to 15 mg/kg soil which was approximately 2 times the remediation level of 7.2 mg/kg soil. Pentachlorophenol was detected for the first time during the study at 2.0 mg/kg soil which is slightly above the 0.43 mg/kg

soil remediation level. The bis (2-ethylhexyl) phthalate concentration actually indicated an increase from the six week to the eighteen week sampling period (i.e., 70 mg/kg vs. 300 mg/kg soil). The concentration increase is most likely a result of heterogeneity within the soils. The concentrations of bis (2-ethylhexyl) phthalate after six and eighteen weeks are substantially below the initial value of 610 mg/kg soil. However, each of the later concentrations is well above the remediation level of 1.1 mg/kg soil.

A total of six phthalate esters were monitored during the experimental period. Only two of the phthalate esters were target compounds, di-n-butylphthalate and bis (2-ethylhexyl) phthalate, and were discussed above. Two of the phthalate esters were below the analytical detection limit during most of the study. The two remaining phthalates, dimethyl phthalate and butyl benzyl phthalate indicated significant reductions during the eighteen week period. Dimethyl phthalate and butyl benzyl phthalate concentrations declined from 80 mg/kg soil to 4.7 mg/kg soil and 40 mg/kg soil to 2.0 mg/kg soil, respectively. The percent removal, based on initial and final concentrations, for each of the phthalates, except bis (2-ethylhexyl) phthalate, varies from 91%-95%. The bis (2-ethylhexyl) phthalate concentration only declined by 51% during the experiment. For the majority of the phthalate esters, which are essentially non-volatile, bioremediation is apparently an effective method for removal from the contaminated soils.

The analytical detection limits for Method 8270 (0.40 mg/kg soil) were greater than the remediation levels of several of the target SVOCs. Five specific compounds, including bis (2-chloroethyl) ether, hexachlorobutadiene, 2,4- and 2,6-dinitrotoluene and hexachlorobenzene, could exceed the remediation limits and still be below the analytical detection limits.

During the initial six week phase of the biotreatability study, the concentrations of carcinogenic polyaromatic hydrocarbons (cPAHs) were below the analytical detection limits of either 63 or 49 mg/kg soil. The high detection limits were due to the complexity of the matrix and the high concentrations of several of the contaminants. For the final sample after eighteen weeks, the analytical detection limit was 0.4 mg/kg soil for the cPAHs. The analytical detection limit of 0.4 mg/kg soil for cPAHs exceeded the remediation level of 0.0026 mg/kg soil. In addition, two compounds, benzo(a)pyrene and chrysene, were detected at 0.5 mg/kg soil. The compounds are reported as 1.0 mg/kg soil of cPAHs which is above the remediation level.

The nutrient balance in the amended column indicated that a significant amount of ammonia, but limited nitrate and orthophosphate, remained at the end of the eighteen week experiment (Table 3). The ammonia concentration was 370 mg/kg soil and nitrate and orthophosphate were 4.0 and 0.24 mg/kg soil, respectively. The biological plate counts during the extended period increased slightly from 6.1×10^8 CFU/g soil at six weeks to 1.1×10^9 CFU/g soil at the end of the experimental period. The stable level of microbial colonies indicates continued health of the bacterial population.

The majority of compounds originally identified in the off-site containment soil sample have been reduced to less than either the remediation level or the analytical detection limit. The VOCs and SVOCs were removed by a combination of volatilization and bioremediation. The extent of removal attributable to either mechanism is difficult to quantify, but it is important to remember that during the initial six week experimental phase the greatest removals were consistently observed in the nutrient amended soil column. In addition, the lowest vapor phase concentrations were observed in the nutrient amended column.

Table 1 Results of Final Soil Sample VOC Analysis for OSCA Soils (mg/kg)

Nutrient Amended Soils				
	Initial Study		Extended Study	Remediation Level
Compound	Time Zero	6 weeks	18 weeks	
Vinyl Chloride	<39	<9	<0.006	0.031
Chloroethane	<39	<9	<0.006	2,700
Methylene Chloride	<39	<9	0.010	6.2
Acetone	<39	<9	<0.006	2,400
1,1-Dichloroethene	<39	<9	<0.006	0.098
Chloroform	<39	<9	<0.006	9.5
1,2-Dichloroethane	<39	<9	<0.006	0.64
2-Butanone	<39	<9	<0.006	620
1,1,1-Trichloroethane	<39	<9	<0.006	2,300
Carbon Tetrachloride	<39	<9	<0.006	0.38
1,2-Dichloropropane	<39	<9	<0.006	0.42
Trichloroethene	<39	<9	<0.006	5.3
1,1,2-Trichloroethane	<39	<9	<0.006	0.51
Benzene	<39	<9	<0.006	1
4-Methyl-2-pentanone	71	<9	<0.006	630
Tetrachloroethene	210	26	0.008	1.1
Toluene	990	<9	<0.006	5,000
Chlorobenzene	<39	<9	<0.006	150
Ethylbenzene	580	<9	<0.006	1,300
Styrene	<39	<9	<0.006	1.7
Xylenes (mixed)	3280	328	<0.006	26,000

Table 2 Results of Final Soil Sample SVOC Analysis for OSCA Soils (mg/kg)

Nutrient Amended Soils				
	Initial Study		Extended Study	Remediation Level
Compound	Time Zero	6 weeks	18 weeks	
bis (2-chloroethyl) ether	<9	<7	<0.4	0.027
1,4-Dichlorobenzene	<9	<7	<0.4	2.4
Isophorone	130	50	15	7.2
1,2,4-Trichlorobenzene	<9	<7	<0.4	16
Naphthalene	230	140	10	82
Hexachlorobutadiene	<9	<7	<0.4	0.36
2,6-Dinitrotoluene	<9	<7	<0.4	0.044
2,4-Dinitrotoluene	<9	<7	<0.4	0.044
n-Nitrosodiphenylamine	<9	<7	<0.4	12
Hexachlorobenzene	<9	<7	<0.4	0.018
Pentachlorophenol	<9	<7	2.0	0.43
bis (2-ethylhexyl) Phthalate	610	70	300	1.1
di-n-butylphthalate	350	55	32	2,300
cPAHs	<63	<49	1.0	0.0026

Table 3 Nutrient Analysis for Soil Columns

Sample	pH	Ammonia	Nitrate	Orthophosphate	Microbial
		Conc. (mg/kg soil)	Conc. (mg/kg soil)	Conc. (mg/kg soil)	CFU/g soil
Results					
Time Zero	7.0	249	9	55	1.4×10^5
6 Weeks	6.4	164	<4	<7	6.1×10^8
18 Weeks	6.6	370	4	0.24	1.1×10^9

Appendix A

VOC and SVOC Analysis - (EPA methods 8240 and 8270)

Results from

National Environmental Testing, Inc.

ANALYTICAL REPORT

Report To: Mr. John Polonsky
Vapex Environmental Tech
480 Neponset Street
Canton, MA 02021

Project: Warzyn

06/15/1993

NET Job Number: 93.01502

National Environmental Testing

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730

NET Cambridge Division

ANALYTICAL REPORT

Report To:

Mr. John Polonsky
Vapex Environmental Tech
480 Neponset Street
Canton, MA 02021

Reported By:

National Environmental Testing
NET Atlantic, Incorporated
Cambridge Division
12 Oak Park
Bedford, MA 01730

Report Date: 06/15/1993

NET Job Number: 93.01502

Project: Warzyn

NET Client No: 79670

P.O. No:

Collected By: CLIENT

Shipped Via: FEDEX

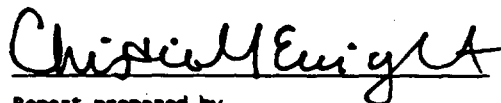
Job Description: Warzyn

Airbill No: 5697653500

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.



D. Wesley Miller
NET Project Manager



Report prepared by
NET Reports Group

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
#1 WAR-MUT COL.	82079	05/20/1993		05/22/1993	SOIL

Laboratory Note:

All compounds reported for the semivolatile analysis were analyzed on 5/26/1993 except bis(2-Ethylhexyl)Phthalate. This compound was reanalyzed at a dilution and reported from the 6/4/1993 run.

NET Cambridge Division

ANALYTICAL REPORT

Report Date: 06/15/1993

Report To: Vapex Environmental Tech

NET Job No: 93.01502

Project: Warzyn

Date Rec'd: 05/22/1993

Sample ID: #1 WAR-MUT COL.

NET Sample No: 82079

Parameter	Result	Units	Analysis Date	Analyst
EX Acid/Base/Neutrals 8270 S	05/25/1993	date	05/25/1993	djb

NET Cambridge Division

ANALYTICAL REPORT

Report Date: 06/15/1993

Report To: Vapex Environmental Tech

NET Job No: 93.01502

Project: Warzyn

Date Rec'd: 05/22/1993

Sample ID: #1 WAR-MUT COL.

NET Sample No: 82079

Parameter	Result	Units	Analysis Date	Analyst

TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	05/28/1993	bel
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropene	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK)	<6.0	ug/Kg		
Methylene Chloride	10	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	8	ug/Kg		
Tetrachloroethene	8	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division

ANALYTICAL REPORT

Report Date: 06/15/1993

Report To: Vapex Environmental Tech

NET Job No: 93.01502

Project: Marzyn

Date Rec'd: 05/22/1993

Sample ID: #1 WAR-MUT COL.

NET Sample No: 82079

Parameter	Result	Units	Analysis Date	Analyst

TCL Acid/Base/Neutrals 8270 S				
Acenaphthene	500	ug/Kg	05/26/1993	mtl
Acenaphthylene	<400	ug/Kg	05/26/1993	
Anthracene	<400	ug/Kg	05/26/1993	
Benzo(a)Anthracene	<400	ug/Kg	05/26/1993	
Benzo(a)Pyrene	500	ug/Kg	05/26/1993	
Benzo(b)Fluoranthene	<400	ug/Kg	05/26/1993	
Benzo(g,h,i)Perylene	<400	ug/Kg	05/26/1993	
Benzo(k)Fluoranthene	<400	ug/Kg	05/26/1993	
Benzoic Acid	<400	ug/Kg	05/26/1993	
Benzyl Alcohol	<400	ug/Kg	05/26/1993	
4-Bromophenyl-phenylether	<400	ug/Kg	05/26/1993	
Butylbenzylphthalate	4700	ug/Kg	05/26/1993	
4-Chloro-3-Methylphenol	<400	ug/Kg	05/26/1993	
4-Chloroaniline	<400	ug/Kg	05/26/1993	
bis(2-Chloroethoxy)Methane	<400	ug/Kg	05/26/1993	
bis(2-Chloroethyl)Ether	<400	ug/Kg	05/26/1993	
bis(2-Chloroisopropyl)Ether	<400	ug/Kg	05/26/1993	
2-Chloronaphthalene	<400	ug/Kg	05/26/1993	
2-Chlorophenol	<400	ug/Kg	05/26/1993	
4-Chlorophenyl-phenylether	<400	ug/Kg	05/26/1993	
Chrysene	500	ug/Kg	05/26/1993	
Di-n-Butylphthalate	32000	ug/Kg	05/26/1993	
Di-n-Octyl Phthalate	700	ug/Kg	05/26/1993	
Dibenz(a,h)Anthracene	<400	ug/Kg	05/26/1993	
Dibenzofuran	<400	ug/Kg	05/26/1993	
1,2-Dichlorobenzene	<400	ug/Kg	05/26/1993	
1,3-Dichlorobenzene	<400	ug/Kg	05/26/1993	
1,4-Dichlorobenzene	<400	ug/Kg	05/26/1993	
3,3'-Dichlorobenzidine	<400	ug/Kg	05/26/1993	
2,4-Dichlorophenol	<400	ug/Kg	05/26/1993	
Diethylphthalate	500	ug/Kg	05/26/1993	
Dimethyl Phthalate	2000	ug/Kg	05/26/1993	
2,4-Dimethylphenol	<400	ug/Kg	05/26/1993	
4,6-Dinitro-2-Methylphenol	<400	ug/Kg	05/26/1993	
2,4-Dinitrophenol	<400	ug/Kg	05/26/1993	
2,4-Dinitrotoluene	<400	ug/Kg	05/26/1993	
2,6-Dinitrotoluene	<400	ug/Kg	05/26/1993	
bis(2-Ethylhexyl)Phthalate	300000	ug/Kg	06/04/1993	
Fluoranthene	600	ug/Kg	05/26/1993	
Fluorene	<400	ug/Kg	05/26/1993	
Hexachlorobenzene	<400	ug/Kg	05/26/1993	
Hexachlorobutadiene	<400	ug/Kg	05/26/1993	
Hexachlorocyclopentadiene	<400	ug/Kg	05/26/1993	
Hexachloroethane	<400	ug/Kg	05/26/1993	
Indeno(1,2,3-cd)Pyrene	<400	ug/Kg	05/26/1993	
Isophorone	15000	ug/Kg	05/26/1993	
2-Methylnaphthalene	4700	ug/Kg	05/26/1993	

NET Cambridge Division

ANALYTICAL REPORT

Report Date: 06/15/1993

Report To: Vapex Environmental Tech

NET Job No: 93.01502

Project: Warzyn

Date Rec'd: 05/22/1993

Sample ID: #1 WAR-MUT COL.

NET Sample No: 82079

Parameter	Result	Units	Analysis Date	Analyst
2-Methylphenol	<400	ug/Kg	05/26/1993	mtl
4-Methylphenol	2000	ug/Kg	05/26/1993	
N-Nitroso-di-n-Propylamine	<400	ug/Kg	05/26/1993	
N-Nitrosodimethylamine	<400	ug/Kg	05/26/1993	
N-Nitrosodiphenylamine	<400	ug/Kg	05/26/1993	
Naphthalene	10000	ug/Kg	05/26/1993	
2-Nitroaniline	<400	ug/Kg	05/26/1993	
3-Nitroaniline	<400	ug/Kg	05/26/1993	
4-Nitroaniline	<400	ug/Kg	05/26/1993	
Nitrobenzene	<400	ug/Kg	05/26/1993	
2-Nitrophenol	<400	ug/Kg	05/26/1993	
4-Nitrophenol	<400	ug/Kg	05/26/1993	
Pentachlorophenol	2000	ug/Kg	05/26/1993	
Phenanthrene	1000	ug/Kg	05/26/1993	
Phenol	2000	ug/Kg	05/26/1993	
Pyrene	1000	ug/Kg	05/26/1993	
1,2,4-Trichlorobenzene	<400	ug/Kg	05/26/1993	
2,4,5-Trichlorophenol	<400	ug/Kg	05/26/1993	
2,4,6-Trichlorophenol	<400	ug/Kg	05/26/1993	

NET Cambridge Division

QUALITY CONTROL DATA

Client: Vapex Environmental Tech

NET Job No: 93.01502

Project: Warzyn

Report Date: 06/15/1993

Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
Bromofl	1,2-Dic	Toluene	2-Fluor	Phenol-	2,4,6-T	2-Fluor	Nitrobe	p-Terph			

Sample ID	NET ID	Matrix	Percent Recovery									SS10	SS11	SS12
			SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9			
#1 WAR-MUT COL.	82079	SOIL	75	85	116	DIL	DIL	DIL	DIL	DIL	DIL			

Notes:

NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard.

Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

Pesticide Surrogate Standards:

Decachl = Decachlorobiphenyl

Dibutyl = Dibutylchloroendate

Tetrach = Tetrachloro-m-xylene

Volatile Surrogate Standards:

Bromofl = Bromofluorobenzene

1,2-Dichl = 1,2-Dichloroethane-d4

Toluene = Toluene-d8

Drinking Water Method 524 1,2-Dichl = 1,2-Dichlorobenzene-d4

Semivolatile Surrogate Standards:

2-Fluor (1st) = 2-Fluorobiphenyl

Phenol- = Phenol-d6

2,4,6-T = 2,4,6-Tribromophenol

2-Fluor (2nd) = 2-Fluorophenol

Nitrobe = Nitrobenzene-d5

p-Terph = p-Terphenyl

Herbicides Surrogate Standard:

2,4-Dic = 2,4-Dichlorophenyl acetic acid

Petroleum Hydrocarbon Fingerprint Surrogate Standard:

2-Fluor = 2-Fluorobiphenyl

para-Te = para-Terphenyl

NET Cambridge Division

QUALITY CONTROL DATA

Report To: Vapex Environmental Tech

NET Job No: 93.01502

Project: Warzyn

Report Date : 06/16/1993

Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials

TCL Volatiles by GC/MS 8240 S					
Bromofluorobenzene	101	% recov.	351	05/28/1993	bel
1,2-Dichloroethane-d4	98	% recov.	351	05/28/1993	bel
Toluene-d8	99	% recov.	351	05/28/1993	bel
Acetone	<5.0	ug/Kg	351	05/28/1993	bel
Benzene	<5.0	ug/Kg	351	05/28/1993	bel
Bromodichloromethane	<5.0	ug/Kg	351	05/28/1993	bel
Bromoform	<5.0	ug/Kg	351	05/28/1993	bel
Bromomethane	<5.0	ug/Kg	351	05/28/1993	bel
2-Butanone (MEK)	<5.0	ug/Kg	351	05/28/1993	bel
Carbon Disulfide	<5.0	ug/Kg	351	05/28/1993	bel
Carbon Tetrachloride	<5.0	ug/Kg	351	05/28/1993	bel
Chlorobenzene	<5.0	ug/Kg	351	05/28/1993	bel
Chloroethane	<5.0	ug/Kg	351	05/28/1993	bel
2-Chloroethylvinyl ether	<5.0	ug/Kg	351	05/28/1993	bel
Chloroform	<5.0	ug/Kg	351	05/28/1993	bel
Chloromethane	<5.0	ug/Kg	351	05/28/1993	bel
Dibromochloromethane	<5.0	ug/Kg	351	05/28/1993	bel
1,2-Dichlorobenzene	<5.0	ug/Kg	351	05/28/1993	bel
1,3-Dichlorobenzene	<5.0	ug/Kg	351	05/28/1993	bel
1,4-Dichlorobenzene	<5.0	ug/Kg	351	05/28/1993	bel
1,1-Dichloroethane	<5.0	ug/Kg	351	05/28/1993	bel
1,2-Dichloroethane	<5.0	ug/Kg	351	05/28/1993	bel
1,1-Dichloroethene	<5.0	ug/Kg	351	05/28/1993	bel
trans-1,2-Dichloroethene	<5.0	ug/Kg	351	05/28/1993	bel
1,2-Dichloropropene	<5.0	ug/Kg	351	05/28/1993	bel
cis-1,3-Dichloropropene	<5.0	ug/Kg	351	05/28/1993	bel
trans-1,3-Dichloropropene	<5.0	ug/Kg	351	05/28/1993	bel
Ethylbenzene	<5.0	ug/Kg	351	05/28/1993	bel
2-Hexanone	<5.0	ug/Kg	351	05/28/1993	bel
4-Methyl-2-pentanone (MIBK)	<5.0	ug/Kg	351	05/28/1993	bel
Methylene Chloride	<5.0	ug/Kg	351	05/28/1993	bel
Styrene	<5.0	ug/Kg	351	05/28/1993	bel
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	351	05/28/1993	bel
Tetrachloroethene	<5.0	ug/Kg	351	05/28/1993	bel
Toluene	<5.0	ug/Kg	351	05/28/1993	bel
1,1,1-Trichloroethane	<5.0	ug/Kg	351	05/28/1993	bel
1,1,2-Trichloroethane	<5.0	ug/Kg	351	05/28/1993	bel
Trichloroethene	<5.0	ug/Kg	351	05/28/1993	bel
Trichlorofluoromethane	<5.0	ug/Kg	351	05/28/1993	bel
Vinyl Acetate	<5.0	ug/Kg	351	05/28/1993	bel
Vinyl Chloride	<5.0	ug/Kg	351	05/28/1993	bel
m-Xylene	<5.0	ug/Kg	351	05/28/1993	bel
o-Xylene	<5.0	ug/Kg	351	05/28/1993	bel
p-Xylene	<5.0	ug/Kg	351	05/28/1993	bel

NET Cambridge Division

QUALITY CONTROL DATA

Report To: Vapex Environmental Tech

NET Job No: 93.01502

Project: Warzyn

Report Date : 06/15/1993

Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials

TCL Acid/Base/Neutrals 8270 S					
2-Fluorophenol	72	% recov.	206	05/26/1993	mtl
Phenol-d5	75	% recov.	206	05/26/1993	mtl
2,4,6-Tribromophenol	76	% recov.	206	05/26/1993	mtl
2-Fluorobiphenyl	76	% recov.	206	05/26/1993	mtl
Nitrobenzene-d15	80	% recov.	206	05/26/1993	mtl
p-Terphenyl-d14	82	% recov.	206	05/26/1993	mtl
Acenaphthene	<40	ug/Kg	206	05/26/1993	mtl
Acenaphthylene	<40	ug/Kg	206	05/26/1993	mtl
Anthracene	<40	ug/Kg	206	05/26/1993	mtl
Benzo(a)Anthracene	<40	ug/Kg	206	05/26/1993	mtl
Benzo(a)Pyrene	<40	ug/Kg	206	05/26/1993	mtl
Benzo(b)Fluoranthene	<40	ug/Kg	206	05/26/1993	mtl
Benzo(g,h,i)Perylene	<40	ug/Kg	206	05/26/1993	mtl
Benzo(k)Fluoranthene	<40	ug/Kg	206	05/26/1993	mtl
4-Bromophenyl-phenylether	<40	ug/Kg	206	05/26/1993	mtl
Butylbenzylphthalate	<40	ug/Kg	206	05/26/1993	mtl
4-Chloro-3-Methylphenol	<40	ug/Kg	206	05/26/1993	mtl
bis(2-Chloroethoxy)Methane	<40	ug/Kg	206	05/26/1993	mtl
bis(2-Chloroethyl)Ether	<40	ug/Kg	206	05/26/1993	mtl
bis(2-Chloroisopropyl)Ether	<40	ug/Kg	206	05/26/1993	mtl
2-Chloronaphthalene	<40	ug/Kg	206	05/26/1993	mtl
2-Chlorophenol	<40	ug/Kg	206	05/26/1993	mtl
4-Chlorophenyl-phenylether	<40	ug/Kg	206	05/26/1993	mtl
Chrysene	<40	ug/Kg	206	05/26/1993	mtl
Di-n-Butylphthalate	<40	ug/Kg	206	05/26/1993	mtl
Di-n-Octyl Phthalate	<40	ug/Kg	206	05/26/1993	mtl
Dibenz(a,h)Anthracene	<40	ug/Kg	206	05/26/1993	mtl
1,2-Dichlorobenzene	<40	ug/Kg	206	05/26/1993	mtl
1,3-Dichlorobenzene	<40	ug/Kg	206	05/26/1993	mtl
1,4-Dichlorobenzene	<40	ug/Kg	206	05/26/1993	mtl
3,3'-Dichlorobenzidine	<40	ug/Kg	206	05/26/1993	mtl
2,4-Dichlorophenol	<40	ug/Kg	206	05/26/1993	mtl
Diethylphthalate	<40	ug/Kg	206	05/26/1993	mtl
Dimethyl Phthalate	<40	ug/Kg	206	05/26/1993	mtl
2,4-Dimethylphenol	<40	ug/Kg	206	05/26/1993	mtl
4,6-Dinitro-2-Methylphenol	<40	ug/Kg	206	05/26/1993	mtl
2,4-Dinitrophenol	<40	ug/Kg	206	05/26/1993	mtl
2,4-Dinitrotoluene	<40	ug/Kg	206	05/26/1993	mtl
2,6-Dinitrotoluene	<40	ug/Kg	206	05/26/1993	mtl
bis(2-Ethylhexyl)Phthalate	<40	ug/Kg	206	05/26/1993	mtl
Fluoranthene	<40	ug/Kg	206	05/26/1993	mtl
Fluorene	<40	ug/Kg	206	05/26/1993	mtl
Hexachlorobenzene	<40	ug/Kg	206	05/26/1993	mtl
Hexachlorobutadiene	<40	ug/Kg	206	05/26/1993	mtl
Hexachlorocyclopentadiene	<40	ug/Kg	206	05/26/1993	mtl
Hexachloroethane	<40	ug/Kg	206	05/26/1993	mtl
Indeno(1,2,3-cd)Pyrene	<40	ug/Kg	206	05/26/1993	mtl
Isophorone	<40	ug/Kg	206	05/26/1993	mtl
N-Nitroso-di-n-Propylamine	<40	ug/Kg	206	05/26/1993	mtl
N-Nitrosodimethylamine	<40	ug/Kg	206	05/26/1993	mtl

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QUALITY CONTROL DATA

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Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials
N-Nitrosodiphenylamine	<40	ug/Kg	206	05/26/1993	mtl
Naphthalene	<40	ug/Kg	206	05/26/1993	mtl
Nitrobenzene	<40	ug/Kg	206	05/26/1993	mtl
2-Nitrophenol	<40	ug/Kg	206	05/26/1993	mtl
4-Nitrophenol	<40	ug/Kg	206	05/26/1993	mtl
Pentachlorophenol	<40	ug/Kg	206	05/26/1993	mtl
Phenanthrene	<40	ug/Kg	206	05/26/1993	mtl
Phenol	<40	ug/Kg	206	05/26/1993	mtl
Pyrene	<40	ug/Kg	206	05/26/1993	mtl
1,2,4-Trichlorobenzene	<40	ug/Kg	206	05/26/1993	mtl
2,4,6-Trichlorophenol	<40	ug/Kg	206	05/26/1993	mtl